

FRESH WATER III

HIGH-OUTPUT OZONE PURIFICATION SYSTEM INSTALLATION INSTRUCTIONS & OPERATOR'S GUIDE

IMPORTANT SAFETY INSTRUCTIONS

When installing and using this electrical equipment, basic safety precautions should always be followed, including the following:

READ AND FOLLOW ALL INSTRUCTIONS

DANGER

High voltage. Risk of electric shock. Do not open ozone cabinet. No user serviceable parts.

To reduce the risk of injury, do not permit children to use this product unless they are closely supervised at all times.

WARNINGS:



To reduce the risk of electrical shock, do not operate if power cord is damaged.

Install in accordance with the installation instructions provided. Install only under the spa skirt as directed.

Do not operate with cover off. Do not operate with ozone tubing disconnected. Do not operate with bonding wire disconnected.

Do not breathe the concentrated ozone output generated by this unit since exposure can be hazardous or fatal. Do not suck on tubing. Replace damaged tubing immediately.

Disconnect power to spa prior to any servicing.

Improper installation of this generator that leads to a component failure will void the component's warranty.

If the power cord of this appliance is damaged, the complete ozone assembly must be replaced.

SAVE THESE INSTRUCTIONS

HOW THE SYSTEM WORKS:

So you can better understand how to install your FRESH WATER III Ozone Purification System, it may be helpful to explain how ozone is generated and how the ozone gets into your spa water. The principle is simple. Ozone is produced from the "free" air surrounding the Ozone Purification System by exposing the oxygen (contained in air) to a special encapsulated corona discharge which is located inside the cabinet. Air movement through the corona discharge chamber (CD chamber) is produced via a specially designed ozone injector installed in the heater/filter line. As water passes through the injector, a vacuum is created within the ozone supply hose. This vacuum draws air from outside the Ozone Purification System to inside the unit where the ozone is produced. Next, the ozone travels down the supply tubing, through the injector, and into the spa water. Ozone and chlorine are used to kill bacteria, destroy harmful microorganisms, neutralize viruses and oxidize water impurities, keeping your spa water clear, fresh and appealing.

OPERATION NOTE:

Condensation of vapor may occur within the supply tubing after severe temperature changes or in high humidity situations. If this condition occurs, ozone flow will be reduced (as indicated by fewer bubbles emerging from the heater return fitting). The condensation will eventually evaporate as temperatures stabilize and ozone flow will resume. Maintain recommended Free Available Chlorine residual to ensure water sanitation during these periods.

PRIOR TO INSTALLATION:

Before your system is installed, a water analysis should be completed to optimize performance and make certain the system will operate within ideal conditions. For best results, follow these guidelines:

pH 7.4 - 7.6

Total Alkalinity 125 - 150 ppm

Calcium hardness 200 ppm

If spa water contains minerals, a sequestering agent should be used prior to start-up. Refer to Water Quality and Maintenance (Section VI) in your spa Owner's Manual. NOTE: Failure to remove minerals may cause staining of the spa surface. Due to the oxidizing effects of ozone on the minerals, stains can generally be removed with spa surface cleaning agents or baking soda.

CHECK VALVE:

The FRESH WATER III Ozone Purification System comes with one check valve to prevent water from backing up into the unit. The check valve is installed in the ozone supply hose on the injector side of the anti-syphoning loop (See Figure 1).

FILTRATION & "SKIMMING" ACTION:

As an oxidizing agent, ozone has a 50% higher oxidizing potential than chlorine. For this reason, ozone will oxidize more organic wastes and contamination than conventional spa chemicals. These oxidized materials do not disappear into thin air however! They are reduced to their lowest elements and generally float to the water's surface where they are removed through the skimmer. In general, you will notice that your spa's filters will get dirty faster, but will be easier to clean. This is due to the higher level of filtration and oxidizing of body oils that accumulate on the surface of the filter cartridge. Clean the filters upon start-up or before refilling for optimum results.

OZONE & CHLORINE TO ELIMINATE CHLORAMINES:

Free Available Chlorine (FAC) is an excellent disinfectant. However, Combined Chlorine (CC), or chloramines, are poor sanitizers and contribute to odors, burning eyes and skin irritations caused by spa water. The use of ozone along with chlorine (Watkins Manufacturing only recommends sodium dichloro-s-triazinetriene, i.e. Dichlor) prevents chloramines from forming, as ozone reacts with organics which are responsible for chloramine development.

OZONE & CHLORINE COMPLEMENT ONE ANOTHER:

Ozone and chlorine are an ideal combination in residential spas because they complement one another. Ozone is a very effective oxidizing agent that has a very short life span and does not maintain a residual sanitizing effect. Chlorine, however, is not as effective as an oxidizing agent as ozone but has a much longer lifespan and will maintain a residual sanitizing effect. For these reasons, ozone and chlorine "team up" for excellent results, using ozone for its "oxidizing power" and chlorine for a "back up" chemical residual. For best results with ozone in residential spas, test water and administer chemicals on a daily basis.

SHOCK TREATMENTS:

After heavy usage, chemical shock treatments are recommended to immediately correct spa water conditions. Use Chlorine (Dichlor) or potassium monopersulfate.

CHLORINE TEST KITS:

Watkins Manufacturing recommends the use of a standard DPD chlorine test kit or test strips for testing your spa water. Maintaining a residual of the recommended residual of Free Available Chlorine, combined with ozone, should keep your spa water crystal-clear and sanitized. Contact your Authorized HOT SPRING Spa Dealer to purchase a DPD test kit or test strips.

SAFETY:

Our Freshwater III Ozone system has been designed and tested for safety, in both application and use. When properly installed in a Watkins Manufacturing Corp. spa model, the ozone system exhibits many important safety features, including the following:

- The Ozone Generator is protected electrically by the GFCI.
- The Ozone performs its oxidizing duty and dissociates before gassing off.

SPECIALTY CHEMICALS:

If spa water contains minerals, a sequestering agent is recommended. If algaecides are used, select polymer types or non-metallic (and non-foaming) formulas.

DANGER: Risk of electrical shock. Do not mount the Ozone Purification System to the exterior of the spa (i.e., spa skirt). The ozone unit must be properly connected to the control box.

WARNING: Unit should be installed and serviced by qualified personnel only. Before servicing, disconnect electrical power to spa. Do not operate unit with ozone supply hose unattached.

Installation Instructions

TOOLS REQUIRED:

Cordless drill with Phillips screwdriver bit
2 Hose clamping pliers
Knife or hose cutter
Flathead Screwdriver

OZONE COMPONENTS:

The following components are provided to be used in your ozone system:

Ozone generator	Tie wraps (two)
Ozone injector (black)	Norprene tubing with check valve - 72"
Installation instructions	Mounting screw (1)
(2) Hose clamps - 3/4"	

Read all instructions before beginning actual installation. Contact your HOT SPRING Spa Dealer for additional information.

OZONE INJECTOR INSTALLATION

1. Disconnect power to spa.
2. Remove the equipment compartment door.
3. Locate the label on the vinyl tubing on the discharge side of the heater that reads "PRE-PLUMBED FOR A HOT SPRING OZONE PURIFICATION SYSTEM".
4. Clamp the vinyl tubing on both sides of the label using the hose clamp pliers. On some model spas, the location of the label does not allow enough room for the hose clamps to be placed between the label and the previous fitting. In this case the hose clamp should be placed on intake to the heater assembly. *NOTE: If the spa does not have water in it, skip this step.*
5. Using the hose cutter or knife, cut the vinyl tubing at the locations indicated by the label. This will remove approximately 4" of vinyl tubing.
6. Place one of the hose clamps (supplied with kit) onto each end of the vinyl tubing. Move the clamps down the tubing to the point where the injector can be installed into the tubing without interference from the hose clamps.
7. Position the injector with the connection fitting pointing "up" if possible.
8. Install the injector (the check valve and norprene tubing should be in place). The flow arrow on the injector must point in the same direction as the water flow (the direction of flow is from the heater toward the spa).
9. Remove the hose clamp pliers from the vinyl tubing. *NOTE: Skip this step if the spa does not have water in it.*
10. Leave the end of the norprene tubing (connected to the injector) hanging free at this point.

OZONE GENERATOR INSTALLATION

1. Locate the ozone generator installation label, mounted on the wall of the equipment compartment.
2. Install the Ozone generator onto the ozone generator installation label. Hang the Ozone generator on the existing screw located just above the label. A key-hole is provided in the plastic Ozone generator enclosure. Use the mounting screws provided with the Ozone generator to fasten the bottom of the Ozone generator unit. The hole has been predrilled in the equipment compartment to help ease installation. The label has been carefully located to prevent the screws from penetrating a plumbing line and causing a leak. For this reason, always mount the Ozone generator on the label.

Note: Depending on the spa model, it may be necessary to adjust the placement of the mounting screw to accommodate the Ozone generator.

CONNECTING NORPRENE TUBING AND OZONE GENERATOR

1. Loop the norprene tubing so a portion of the tubing is above the waterline. The Anti-Syphoning loop will prevent water from entering the Ozone generator if the check valve in the ozone supply hose fails. To ensure that the Norprene tubing will not kink, allow for an approx. 3" diameter loop. See Figure 1 for assistance.

NOTE: The Check Valve must be installed on the injector side of the the Anti-Syphoning loop.

2. The norprene tubing will be longer than is needed. Using very sharp cutters (to prevent crushing the tubing) cut the tubing to the length required by the particular spa.
3. Push loose end of norprene tubing onto ozone outlet nipple.
4. Using the Tie wraps, secure the Anti-Syphoning loop into place.

CONNECTING OZONE GENERATOR TO CONTROL BOX

1. Install the Ozone generator's electrical plug into the small receptacle hanging from the bottom of the control box. The fit is tight, so make sure the plug is inserted completely into the receptacle.

CRITICAL: Route the wiring from the ozone generator as far away from other spa wiring as possible. Special care should be taken to keep the thermistor wires, control panel ribbon cable, and auxiliary panel cable seperated from the ozone generator wiring.

COMPLETING THE INSTALLATION

1. Reinstall the equipment compartment door.
2. Connect power to the spa.
3. Verify the Ozone generator is working properly by checking the green LED on the bottom of the unit, bubbles entering the spa from the heater return, and a faint buzzing sound coming from the Ozone generator.

SPA MONITORING:

Use of the Ozone Purification System significantly enhances the quality of your spa water. However, to provide a hygienic and pleasant environment, Watkins Manufacturing recommends following the “FOUR-STEP, SPA START UP AND MAINTENANCE PROGRAM” contained in the *Water Chemistry* section of your spa Owners Manual. The Four-Step program includes the routine monitoring and adjustment of Total Alkalinity, Calcium Hardness, pH level and Sanitization; which are all essential elements of water conditioning.

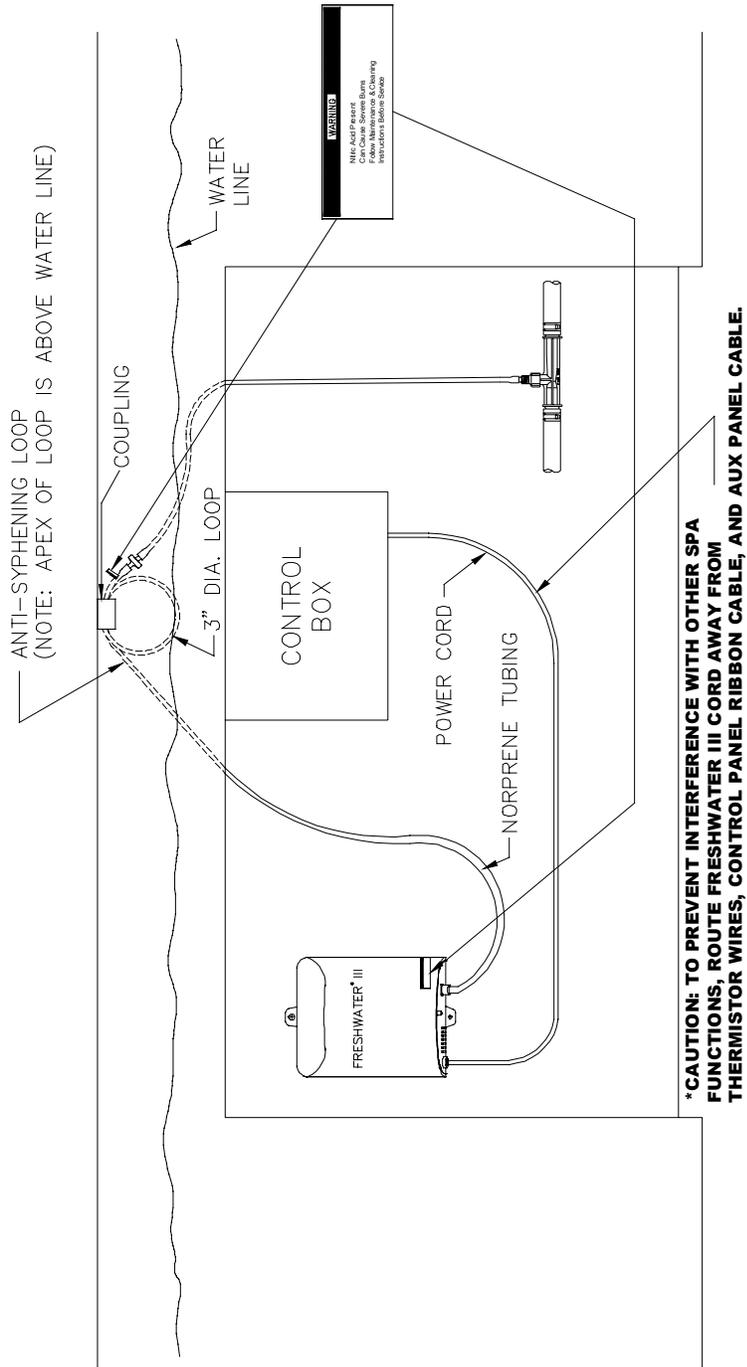
IMPORTANT:

Refer to the water chemistry section of the spa Owner's Manual for detailed instruction on chemical application procedures and cautions. Remember that a high pH water condition allows only 20% of the total chlorine to be available for sanitizing. Balanced pH, on the other hand, allows 80% of total chlorine to be available for sanitizing.

WARRANTY SERVICE:

All warranty service must be performed by an Authorized HOT SPRING Spa Dealer. If you are unable to locate an authorized dealer, contact Watkins Manufacturing Corporation Customer Service Department at (800)999-4688 extension 432. NOTE: Your authorized dealer may request a bill of sale before performing any warranty service work.

OZONE SYSTEM GENERATOR



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NOTE: IF SPA DOES NOT HAVE A MOUNTED COUPLING, ROUTE THE NORPRENE TUBING OVER THE AIRLINE AND SECURE WITH TIE WRAPS.

FIGURE 1